

## WHAT IS CLAIMED IS:

- 1           1.     A flush-mount antenna system, to enable communication with a moving  
2     vehicle via a satellite, comprising:  
3                 a cavity having a rectangular upper perimeter with four sides and having a  
4     depth normal to said perimeter;  
5                 an array comprising a plurality of subarrays of rectangular form positioned  
6     in a rectangular arrangement having length and width edges, each such subarray including  
7     at least one waveguide having slot-type radiating elements;  
8                 said array positioned within said cavity and arranged for rotation about an  
9     axis-of-rotation adjacent to an edge of the array and aligned with a side of the upper  
10    perimeter;  
11                an elevation scan actuator to mechanically tilt said array about said axis-  
12    of-rotation without removing the array from said cavity;  
13                a signal port; and  
14                a feed configuration to couple signals between the signal port and each  
15    subarray.

- 1           2.     A flush-mount antenna system as in claim 1, additionally comprising:  
2                 an azimuth scan assembly to mechanically rotate said array to provide  
3     scanning in azimuth.

1           3.       A flush-mount antenna system as in claim 2, wherein the azimuth scan  
2 assembly is arranged to mechanically rotate said cavity and the array positioned therein.

1           4.       A flush-mount antenna system as in claim 1, wherein the array comprises  
2 square flat-plate type subarrays contiguously positioned in a rectangular array.

1           5.       A flush-mount antenna system as in claim 1, wherein each individual  
2 subarray of said plurality includes slotted waveguides in parallel side-by-side arrangement  
3 and each waveguide includes at least one row of slot-type radiating elements.

1           6.       A flush-mount antenna system as in claim 1, wherein said slot-type  
2 radiating elements comprise crossed-slot radiating elements.

1           7.       A flush-mount antenna system as in claim 1, wherein a length edge of the  
2 array is positioned adjacent to said axis-of-rotation.

1           8.       An antenna system, to enable communication via satellite, comprising:  
2                   a cavity having an upper perimeter and a depth normal to said perimeter;  
3                   an array comprising a plurality of subarrays positioned in a two-  
4 dimensional arrangement having an edge section and configured to provide a beam  
5 pattern, each said subarray including at least one waveguide section having slot-type

6 radiating elements;

7 said array positioned within said cavity and arranged for rotation about an  
8 axis-of-rotation adjacent to said edge section of the array to scan the beam pattern in  
9 elevation;

10 an elevation scan actuator to mechanically tilt said array by rotation about  
11 said axis-of-rotation without removing the array from said cavity;

12 a signal port; and

13 a feed configuration to couple signals between the signal port and each  
14 subarray.

1 9. An antenna system as in claim 8, additionally comprising:

2 an azimuth scan assembly to mechanically rotate said array to scan the  
3 beam pattern in azimuth

1 10. An antenna system as in claim 9, wherein the azimuth scan assembly is  
2 arranged to mechanically rotate said cavity and the array positioned therein.

1 11. An antenna system as in claim 8, wherein the array comprises square flat-  
2 plate type subarrays contiguously positioned in a rectangular array.

1 12. An antenna system as in claim 8, wherein each individual subarray of said

2 plurality includes slotted waveguides in parallel side-by-side arrangement and each  
3 waveguide includes at least one row of slot type radiating elements.

1 13. An antenna system as in claim 8, wherein said slot-type radiating elements  
2 comprise crossed-slot radiating elements.

1 14. An antenna system as in claim 8, wherein the upper perimeter includes a  
2 linear side portion and said axis-of-rotation is adjacent and parallel to said linear side  
3 portion and said array edge section.

1 15. An antenna system, to enable communication via satellite, comprising:  
2 a cavity having an upper perimeter and a depth normal to said perimeter;  
3 an array comprising a plurality of subarrays positioned in a two-  
4 dimensional arrangement and configured to provide a beam pattern, each said subarray  
5 including at least one waveguide section having slot-type radiating elements;  
6 said array positioned within said cavity and arranged for rotation about an  
7 axis-of-rotation to scan the beam pattern in elevation;  
8 an elevation scan actuator to mechanically tilt said array by rotation about  
9 said axis-of-rotation without removing the array from said cavity;  
10 a signal port; and  
11 a feed configuration to couple signals between the signal port and each

12 subarray.

1 16. An antenna system as in claim 15, additionally comprising:  
2 an azimuth scan assembly to mechanically rotate said array to scan the  
3 beam pattern in azimuth

1 17. An antenna system as in claim 16, wherein the azimuth scan assembly is  
2 arranged to mechanically rotate said cavity and the array positioned therein.

1 18. An antenna system as in claim 15, wherein the array comprises square flat-  
2 plate type subarrays contiguously positioned in a rectangular array.

1 19. An antenna system as in claim 15, wherein each individual subarray of  
2 said plurality includes slotted waveguides in parallel side-by-side arrangement and each  
3 waveguide includes at least one row of slot type radiating elements.

1 20. An antenna system as in claim 15, wherein said slot-type radiating  
2 elements comprise crossed-slot radiating elements.

1 21. An antenna system as in claim 15, wherein the upper perimeter includes a  
2 linear side portion, the array includes a linear edge section and said axis-of-rotation is

- 3 adjacent and parallel to said side portion and said edge section.